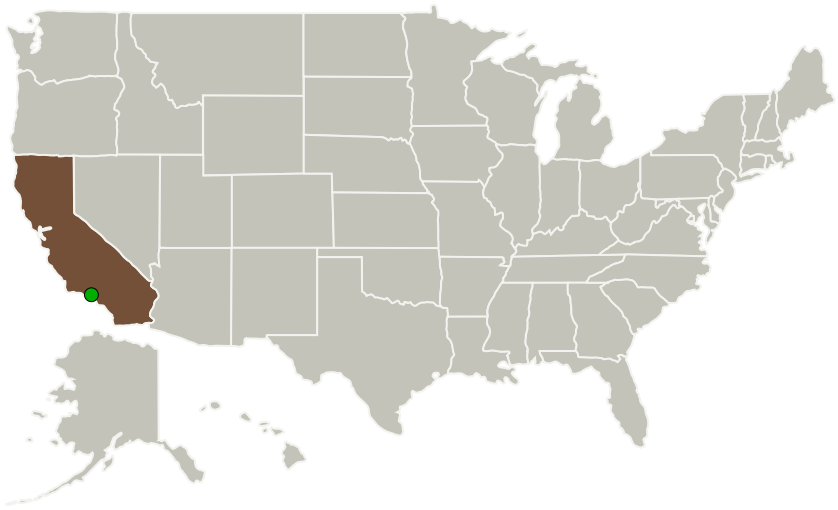
3D Flash LIDAR Space Laser, Phase II

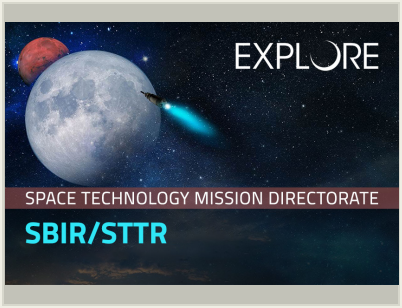
Completed Technology Project (2013 - 2016)

Project Introduction

Advanced Scientific Concepts, Inc. (ASC) is a small business that has developed 3D Flash LIDAR systems for space and terrestrial applications. 3D Flash LIDAR is ideal for determining real-time spacecraft trajectory, speed and orientation to the planet's surface, as well as evaluating potential landing sites. Flash LIDAR sensors utilize a 3DFPA and rely on the illumination of a 10nsec pulse from a diode pumped solid state (DPSSL) q-switched Nd:YAG laser. Improvements in pulse shape and stability are crucial to improve range resolution for higher resolution landing maps. ASC is proposing an innovative approach to the laser and thermal management to meet NASAs requirement for a compact, robust planetary landing sensor. An innovative approach for an optically triggered "semi-active" q-switch will allow for increased power stability in a very compact laser design. The semi-active fused q-switch will eliminate the need for a mechanical or electro optical q-switch by actively bleaching the passive q-switch with a laser diode. The advantage of the Cr4:YAG crystal over active q-switches is that it can be fused directly onto the YAG laser rod creating a monolithic laser cavity reducing the number of coated surfaces and the overall size.

Primary U.S. Work Locations and Key Partners





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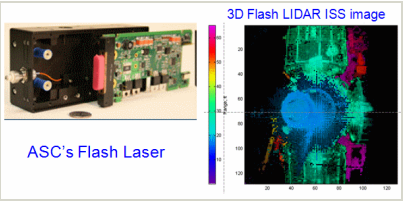
Organizations Performing Work	Role	Type	Location
Advanced Scientific Concepts, Inc.	Lead Organization	Industry	Goleta, California
Jet Propulsion Laboratory(JPL)	Supporting Organization	NASA Center	Pasadena, California

Primary U.S. Work Locations
California

Images



Briefing Chart
3D Flash LIDAR Space Laser, Phase II
(https://techport.nasa.gov/image/134580)

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Organization:
Advanced Scientific Concepts, Inc.

Responsible Program:
Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Principal Investigator:
Brad Short

Co-Investigator:
Bradley Short

3D Flash LIDAR Space Laser, Phase II

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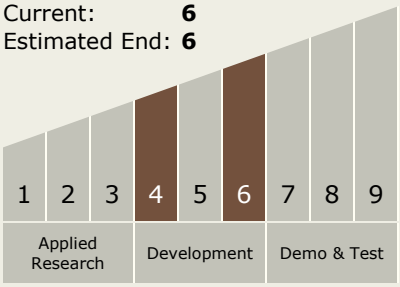
Technology Maturity (TRL)

Start: **4**
Current: **6**
Estimated End: **6**



Technology Areas

Primary:

- TX09 Entry, Descent, and Landing
  - TX09.4 Vehicle Systems
    - TX09.4.7 Guidance, Navigation and Control (GN&C) for EDL

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System